

# Validar o hardware da camada 2 nos switches Catalyst 9000 Series

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## Introduction

Este documento descreve como validar a programação e o encaminhamento de hardware de Camada 2 nos switches Catalyst 9400 Series.

## Prerequisites

## Requirements

Não existem requisitos específicos para este documento.

## Componentes Utilizados

As informações neste documento são baseadas no switch da série Catalyst 9400 (UADP 2.0).

**Observação:** a versão do software usada neste documento é 16.6.1, mas isso deve permanecer aplicável para versões posteriores do Cisco IOS-XE.

**Observação:** você pode usar este documento para outros tipos de switches Catalyst 9000, mas ignorar qualquer comando que faça referência a uma placa de linha.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. Se a rede estiver ativa, certifique-se de que você entenda o impacto potencial de qualquer comando.

## Informações de Apoio

- O Catalyst 9400 Supervisor1 (C9400-SUP-1) tem 3 ASICs de encaminhamento UADP 2.0 (0, 1, 2).
- Cada ASIC de encaminhamento UADP 2.0 tem: Um núcleo duplo (0, 1) - isso não existia nas gerações anteriores do ASICS UADP 2.0. SIFs (Stack Interfaces) - usado para se conectar aos outros 2 ASICs UADP 2.0 através de um anel de pilha interno. NIFs (Network Interfaces - Interfaces de Rede) - usado para se conectar a uma ou mais placas de linha através do backplane.
- Todas as decisões de encaminhamento de pacotes para as placas de linha e as interfaces de uplink do supervisor são feitas pelos 3 ASICs de encaminhamento UADP 2.0 no Supervisor ativo.
- As placas de linha usadas neste exemplo têm 1 placa de linha single core stub ASIC que não está envolvida em decisões de encaminhamento de pacotes.
- O ASIC de stub de placa de linha na placa de linha se conecta a 1 ou mais dos 3 ASICs de encaminhamento UADP 2.0 no Supervisor através do painel traseiro.
- Os 3 ASICs de encaminhamento UADP 2.0 no Supervisor tomam todas as decisões de encaminhamento de pacotes.

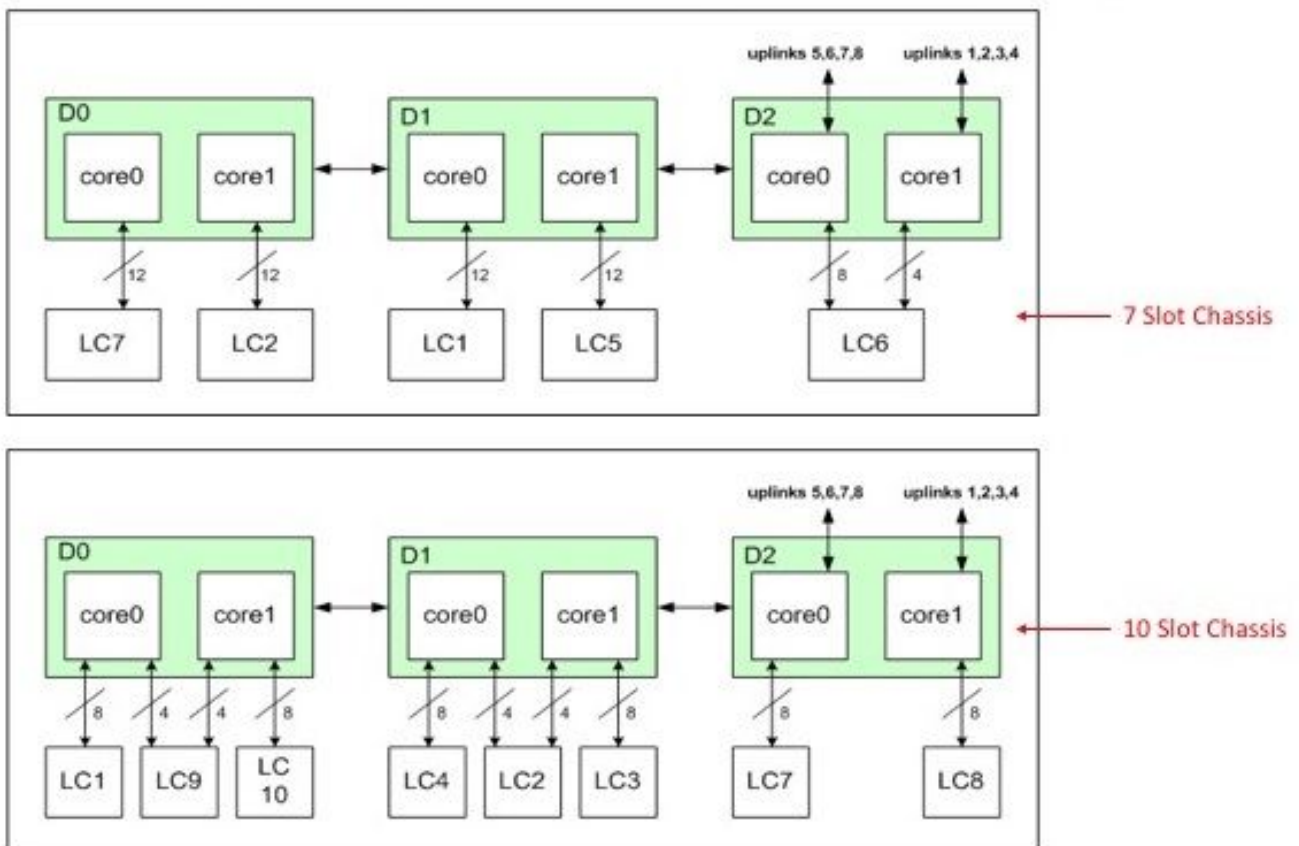
## Terminology

Acrônimo	Definição
RP	Processador de rota
FP	Processador de encaminhamento
ALIMENTAD O	Driver do mecanismo de encaminhamento. O processo de software que programa o ASIC de encaminhamento do supervisor.
Object-	Entradas MAC do software FP que são armazenadas como objetos assíncronos no banco

manager	dados de objetos.
LSMPI	Interface de busca de memória compartilhada Linux. O transporte entre o plano de dados (hardware-UADP 2.0) e o plano de controle (software-CPU).
IFM	Processo de software do Gerenciador de Interface.
IF_ID	Identificador de ID de interface é um valor exclusivo que representa uma interface específica usado durante a programação interna no switch.
Inst	Instância. Indica que a interface Asic/Core do UADP 2.0 a que está conectada: 0=Asic0/Core0, 1=Asic0/Core1, 2=Asic1/Core0, 3=Asic1/Core1, 4=Asic2/Core0, 5=Asic2/Core1.
ASIC	Especifica a qual UADP 2.0 uma interface está associada: 0=UADP 2.0 #0, 1=UADP 2.0 #1, 2=UADP 2.0 #2.
Centro	Especifica qual núcleo na interface UADP 2.0 está associado a: 0=core0, 1=core1.
Porta	Número de instância comum de uma porta dentro de um slot. No mesmo slot, todos os números de porta são exclusivos.
SubPort	Identifica uma porta dentro de um grupo de portas (Cntx) para portas do painel frontal que são sub-portadas (Cntx e SubPort juntas identificam uma porta exclusiva que é Sub-portada).
Mac	Identificador de interface usado quando uma interface está executando MACsec (autenticação de segurança e criptografia).
Cntx	Contexto. Um número de grupo ao qual uma porta pertence quando uma interface do painel frontal é sub-portada (Cntx e SubPort juntas identificam uma porta exclusiva que é Sub-portada).
LPN	Número de porta lógica associado a uma interface.
GPN	Número de porta global associado a uma interface.
Digite NIF	Interface da rede; NRU = Uplink Redundante de Rede
IF_IS	Identificador de interface. Esse é um valor exclusivo que representa uma interface específica usado durante várias programações internamente no switch.
Porta_LE	Port Logical Entity (Entidade Lógica da Porta). Esta é a configuração da interface.
AOM	Gerenciador de objetos assíncrono. O FP programa informações no banco de dados de objetos como um objeto.
VP	Porta virtual
MATM	Gerenciador de Tabela de Endereços MAC
RP	Processador de rota
OM_PTR	Ponteiro do Gerenciador de Objetos
Tbl_ID	Identificador de tabela = vlan
CMAN	Gestor de chassis
FP	Processador de encaminhamento
fp_port	As portas do painel frontal.
Sif	Interface de pilha (em direção aos outros 2 ASICs de encaminhamento UADP 2.0 no Supervisor).
Nif	Interface de rede (em direção à interface do painel frontal)
IGR / EGR	Entrada/saída
IQS	Agendador de fila de entrada
SQS	Agendador de Fila de Pilha
PBC	Complexo de buffer de pacote
AQM	Gerenciamento de fila ativa. Isso verifica o gerenciamento de congestionamento.
AQMRed	Detecção antecipada aleatória do Active Queue Management.

EQC	Controlador de fila de saída
ESM	Gerenciamento do Agendador de Saída
RWE	Mecanismo de reescrita. Adiciona ou exclui informações de cabeçalho do pacote.
IOMD	Driver do módulo de saída de entrada
fp_port	A porta do painel frontal.
Nif	Interface de rede (em direção à interface do painel frontal)
SLI	Interface de enlace do sistema (em direção ao supervisor)
IGR / EGR =	Entrada/saída
AQMRed	Deteção antecipada aleatória do Active Queue Management.
OCI	Interface de controle fora da banda = canal de comunicação interna entre a placa de linha supervisor ativo
MATM	Gerenciador de Tabela de Endereços MAC
Contagem de Mover MAC	Essa é a contagem para quando um endereço MAC se move (é aprendido) em uma nova interface. A contagem de movimentações pode ocorrer quando um host final é movido fisicamente de uma interface para outra, um host sem fio faz roaming de um ponto de acesso (AP) para outro AP conectado em uma interface diferente ou o caminho do spanning tree muda ou faz loops.

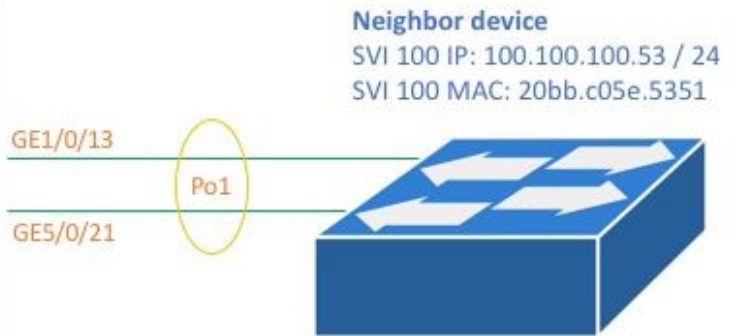
## Line Card (LC) to UADP 2.0 Mapping



Placa de linha para UADP

## Topologia

Catalyst 9400 - Macallan  
 SVI 100 IP: 100.100.100.1 / 24  
 SVI 100 MAC: 2c5a.0f1c.28e1



C9400#show version

```
Cisco IOS XE Software, Version 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.6.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 05:51 by mcpre
--snip--
```

C9400#show module

Chassis Type: C9407R

Mod	Ports	Card Type	Model	Serial No.
1	48	48-Port 10/100/1000 (RJ-45)	C9400-LC-48T	JAE211703RC
2	48	48-Port UPOE 10/100/1000 (RJ-45)	C9400-LC-48U	JAE21150CGD
3	10	Supervisor 1 Module	C9400-SUP-1	JAE21240235
4	10	Supervisor 1 Module	C9400-SUP-1	JAE21240235
5	48	48-Port UPOE 10/100/1000 (RJ-45)	C9400-LC-48U	JAE21150CG9

Mod	MAC addresses	Hw	Fw	Sw	Status
1	E4AA.5D54.C84C to E4AA.5D54.C87B	0.6	16.6.1r	[FC 16.06.01	ok
2	E4AA.5D54.B430 to E4AA.5D54.B45F	0.6	16.6.1r	[FC 16.06.01	ok
3	2C5A.0F1C.28EC to 2C5A.0F1C.28F5	0.6	16.6.1r	[FC 16.06.01	ok
4	2C5A.0F1C.28F6 to 2C5A.0F1C.28FF	0.6	16.6.1r	[FC 16.06.01	ok
5	E4AA.5D54.B658 to E4AA.5D54.B687	0.6	16.6.1r	[FC 16.06.01	ok

Mod	Redundancy Role	Operating Redundancy Mode	Configured Redundancy Mode
3	Active	sso	sso
4	Standby	sso	sso

C9400#show running-config interface port-channel 1

```
interface Port-channel1
switchport trunk allowed vlan 100
switchport mode trunk
```



Interface State : READY  
Interface Status : ADD, UPD  
Interface Ref-Cnt : 7  
Interface Type : ETHER  
Port Type : SWITCH PORT  
Port Location : LOCAL  
Slot : 1  
Unit : 0  
Slot Unit : 13  
SNMP IF Index : 14  
GPN : 1105  
EC Channel : 1  
EC Index : 1  
Port Handle : 0x72000285  
LISP v4 Mobility : false  
LISP v6 Mobility : false  
QoS Trust Type : 0

Port Information

Handle ..... [0x72000285]  
Type ..... [Layer2]  
Identifier ..... [0x13]  
Slot ..... [1]  
Unit ..... [13]

Port Physical Subblock

Affinity ..... [local]  
Asic Instance ..... [2 (A:1,C:0)]  
AsicPort ..... [12]  
AsicSubPort ..... [4]  
MacNum ..... [0]  
ContextId ..... [0]  
LPN ..... [13]  
GPN ..... [113]  
Speed ..... [1GB]  
type ..... [NIF]  
PORT\_LE ..... [0x7fe5c5aabc28]  
L3IF\_LE ..... [0x0]  
EC GPN ..... [1105]  
EC L3IF\_LE ..... [0x0]  
EC Port Mask ..... [0xaaaaaaaaaaaaaaaa]  
DI ..... [0x7fe5c5ab5c48]

Port L2 Subblock

Enabled ..... [Yes]  
**Allow dot1q ..... [Yes] ---> interface Gig1/0/13 is configured as a trunk**  
Allow native ..... [Yes]  
Default VLAN ..... [1]  
Allow priority tag ... [Yes]  
Allow unknown unicast [Yes]  
Allow unknown multicast[Yes]  
Allow unknown broadcast[Yes]  
Allow unknown multicast[Enabled]  
Allow unknown unicast [Enabled]  
IPv4 ARP snoop ..... [No]  
IPv6 ARP snoop ..... [No]  
Jumbo MTU ..... [1500]  
Learning Mode ..... [1]

Port QoS Subblock

Trust Type ..... [0x2]  
Default Value ..... [0]  
Ingress Table Map ..... [0x0]  
Egress Table Map ..... [0x0]  
Queue Map ..... [0x0]

Port Netflow Subblock

Port Policy Subblock

```

List of Ingress Policies attached to an interface
List of Egress Policies attached to an interface
Ref Count : 7 (feature Ref Counts + 1)
IFM Feature Ref Counts
  FID : 100, Ref Count : 1
  FID : 57, Ref Count : 1
  FID : 115, Ref Count : 1
  FID : 17, Ref Count : 1
  FID : 78, Ref Count : 1
  FID : 30, Ref Count : 1

```

```

IFM Feature Sub block information
  FID : 57, Private Data : 0x7fe5c685e748
  FID : 17, Private Data : 0x7fe5c5e85f38
  FID : 30, Private Data : 0x7fe5c5e85aa8

```

Esse comando exibe os detalhes da configuração de hardware para Gig1/0/3 com base no valor de PORT\_LE do comando anterior.

Valor	Definição
Valor 0	O valor não está definido.
Valor 1	O valor definido na maioria dos casos.

```

C9400#show platform hardware fed active fwd-asic abstraction print-resource-handle
0x7fe5c5aabc28 1
Handle:0x7fe5c5aabc28 Res-Type:ASIC_RSC_PORT_LE Res-Switch-Num:0 Asic-Num:2 Feature-
ID:AL_FID_IFM Lkp-ftr-id:LKP_FEAT_INGRESS_PRECLASS1_IPV4 ref_count:1
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index2:0xc mtu_index/13u_ri_index2:0x4 sm
handle [ASIC 2]: 0x7fe5c5abb588

```

Detailed Resource Information (ASIC#2)

```

-----
LEAD_PORT_ALLOW_BROADCAST value 1 Pass LEAD_PORT_ALLOW_CAPWAP value 0 Pass LEAD_PORT_ALLOW_CTS
value 0 Pass LEAD_PORT_ALLOW_DOT1Q_TAGGED value 1 Pass LEAD_PORT_ALLOW_MULTICAST value 1 Pass
LEAD_PORT_ALLOW_NATIVE value 1 Pass LEAD_PORT_ALLOW_NON_CTS value 0 Pass
LEAD_PORT_ALLOW_PRIORITY_TAGGED value 1 Pass LEAD_PORT_ALLOW_UNICAST value 1 Pass
LEAD_PORT_ALLOW_UNKNOWN_ETHER_TYPE value 0 Pass LEAD_PORT_ALLOW_UNKNOWN_UNICAST value 1 Pass
LEAD_PORT_ALLOW_VLAN_LOAD_BALANCE_GROUP value 15 Pass LEAD_PORT_ALLOW_VRF value 0 Pass
LEAD_PORT_ARP_OR_ND_SNOOPING_ENABLED_IPV4 value 0 Pass LEAD_PORT_ARP_OR_ND_SNOOPING_ENABLED_IPV6
value 0 Pass LEAD_PORT_AUTH_MODE value 0 Pass LEAD_PORT_CAPWAP_TUNNEL value 0 Pass
LEAD_PORT_CONTENT_MATCHING_ENABLED value 0 Pass LEAD_PORT_CTS_ENABLED value 0 Pass
LEAD_PORT_CUSTOMER_PORT value 0 Pass LEAD_PORT_DAI_OR_ND_TRUST_MODE_IPV4 value 0 Pass
LEAD_PORT_DAI_OR_ND_TRUST_MODE_IPV6 value 0 Pass LEAD_PORT_DATA_GLEAN_LEARN_IPV4 value 0 Pass --
snip--

```

## Programação Etherchannel

Nesses resultados de exemplo de programação do Etherchannel, o RP programa o FP, o FP programa o FED, o FED e, em seguida, programa o hardware ASIC de encaminhamento do supervisor. As entradas de software RP são armazenadas como objetos no banco de dados de objetos e as entradas de software FP são armazenadas como objetos assíncronos no banco de dados de objetos.

```

C9400#show etherchannel summary
--snip--
Group  Port-channel  Protocol  Ports
-----+-----+-----+-----
1      Po1(SU)        LACP      Gi1/0/13(P) Gi5/0/21(P)

```

A máscara de grupo é diferente de zero nessa saída. Ele é usado no processo hash para



determinar o link no etherchannel onde qualquer fluxo de tráfego sai.

```
C9400#show platform software interface rp active brief
```

```
Forwarding Manager Interfaces Information
```

Name	ID	QFP ID
Null0	1	0
GigabitEthernet1/0/1	7	0
GigabitEthernet1/0/2	8	0
GigabitEthernet1/0/3	9	0
-snip-		
GigabitEthernet1/0/13	19	0
-snip-		
GigabitEthernet5/0/21	143	0
-snip-		
Port-channel1	748	0
-snip-		

```
C9400#show platform software fed active etherchannel 1 group-mask
```

```
Group Mask Info
```

```
Aggport IIF Id: 00000000000002EC ---> hex 0x2EC = dec 748
```

```
Active Port: : 2 -----> 2 active interfaces in the etherchannel = the Member ports below
```

```
Member Ports
```

If Name	If Id	local	Group Mask
GigabitEthernet1/0/13	0000000000000013	true	5555555555555555 ---> hex 0x13 = dec 19
GigabitEthernet5/0/21	000000000000008f	true	aaaaaaaaaaaaaaaa ---> hex 0x8f = dec 143

Esse comando mostra a configuração do Port-channel 1:

```
C9400#show platform software fed active ifm if-id 0x000002ec
```

```
Interface IF_ID : 0x00000000000002ec
```

```
Interface Name : Port-channel1
```

```
Interface Block Pointer : 0x7fe5c685df98
```

```
Interface State : READY
```

```
Interface Status : ADD, UPD
```

```
Interface Ref-Cnt : 5
```

```
Interface Type : ETHERCHANNEL
```

```
Port Type : SWITCH PORT
```

```
Channel Number : 1
```

```
SNMP IF Index : 720
```

```
Port Handle : 0x50002f6
```

```
#Of Active Ports : 2
```

```
Base GPN : 1104
```

```
Index[2] : 0000000000000013 ---> Gig1/0/13 from previous command output
```

```
Index[3] : 000000000000008f ---> Gig5/0/21 from previous command output
```

```
Port Information
```

```
Handle ..... [0x50002f6]
```

```
Type ..... [L2-Ethchannel]
```

```
Identifier ..... [0x2ec]
```

```
Unit ..... [1]
```

```
Port Logical Subblock
```

```
L3IF_LE handle .... [0x0]
```

```
Num physical port . [2]
```

```
GPN Base ..... [1104]
```

```
Num physical port on asic [0] is [0]
```

```
DiBcam handle on asic [0].... [0x0]
```

```

Num physical port on asic [1] is [0]
DiBcam handle on asic [1].... [0x0]
Num physical port on asic [2] is [1] -----> Gig1/0/13 is on ASIC instance 2 (Supervisor ASIC 1, core 0)
DiBcam handle on asic [2].... [0x7fe5c6ae3608]
Num physical port on asic [3] is [1] -----> Gig5/0/21 is on ASIC instance 3 (Supervisor ASIC 1, core 1)
DiBcam handle on asic [3].... [0x7fe5c685d7e8]
Num physical port on asic [4] is [0]
DiBcam handle on asic [4].... [0x0]
Num physical port on asic [5] is [0]
DiBcam handle on asic [5].... [0x0]
Port L2 Subblock
Enabled ..... [No]
Allow dot1q ..... [No]
Allow native ..... [No]
Default VLAN ..... [0]
Allow priority tag ... [No]
Allow unknown unicast [No]
Allow unknown multicast[No]
Allow unknown broadcast[No]
Allow unknown multicast[Enabled]
Allow unknown unicast [Enabled]
IPv4 ARP snoop ..... [No]
IPv6 ARP snoop ..... [No]
Jumbo MTU ..... [0]
Learning Mode ..... [0]
Port QoS Subblock
Trust Type ..... [0x7]
Default Value ..... [0]
Ingress Table Map ..... [0x0]
Egress Table Map ..... [0x0]
Queue Map ..... [0x0]
Port Netflow Subblock
Port Policy Subblock
List of Ingress Policies attached to an interface
List of Egress Policies attached to an interface
Ref Count : 5 (feature Ref Counts + 1)
IFM Feature Ref Counts
FID : 115, Ref Count : 1
FID : 78, Ref Count : 1
No Sub Blocks Present

```

Esse comando mostra a configuração para mapear interfaces.

Acrônimo/instância	Definição
IFM	Gerenciador de Interface
Instância	Gig1/0/13 está na instância 2 do ASIC (ASIC 1 do UADP 2.0, núcleo 0) com ID de interface 0x13
Instância	Gig5/0/21 está na instância 3 do ASIC (UADP 2.0 ASIC 1, núcleo 1) com ID de interface 0x8f

```
C9400#show platform software fed active ifm mappings
```

```

Interface IF_ID Inst Asic Core Port SubPort Mac Cntx LPN GPN Type Active GigabitEthernet1/0/1
0x7 2 1 0 0 4 4 1 101 NIF Y GigabitEthernet1/0/2 0x8 2 1 0 1 1 4 4 2 102 NIF Y --snip--
GigabitEthernet1/0/13 0x13 2 1 0 12 4 0 0 13 1105 NIF Y --snip-- GigabitEthernet5/0/21 0x8f 3 1
1 20 4 5 5 21 1104 NIF Y --snip--

```

## Configuração global do Etherchannel





```
Gi2/0/11 Desg FWD 4 128.107 P2p Po1 Root FWD 3 128.2473 P2p Peer(STP)
```

```
C9400#show etherchannel summary
```

```
--snip--
```

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/13(P) Gi5/0/21(P)

Esses comandos exibem o estado de encaminhamento de spanning tree para o canal de porta 1.

```
C9400#show platform software interface rp active brief
```

```
Forwarding Manager Interfaces Information
```

Name	ID	QFP ID
Null0	1	0
GigabitEthernet1/0/1	7	0
GigabitEthernet1/0/2	8	0
GigabitEthernet1/0/3	9	0
Port-channell	748	0

```
C9400#show platform software fed active vp summary interface if_id 748
```

if_id	vlan_id	pvlan_mode	pvlan_vlan	stp_state	vtp pruned
Untagged					
748	100	trunk	1	forwarding	No

Os próximos comandos exibem o estado de encaminhamento de hardware do spanning tree para a VLAN 100.

```
C9400#show platform software fed active vp summary vlan 100
```

if_id	vlan_id	pvlan_mode	pvlan_vlan	stp_state	vtp pruned
Untagged					
748	100	trunk	1	forwarding	No

```
C9400#show platform hardware fed active vlan 100 ingress
```

```
VLAN STP State in hardware
```

```
vlan id is:: 100
```

```
Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged), Gi5/0/21(Tagged)
```

```
flood list: : Gi2/0/11, Gi1/0/1, Gi1/0/13, Gi5/0/21
```

```
C9400#show platform hardware fed active vlan 100 egress
```

```
VLAN STP State in hardware
```

```
vlan id is:: 100
Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged),
Gi5/0/21(Tagged)
```

Verifique a estabilidade do spanning tree. Certifique-se de que as notificações de alteração de topologia (TCN) sejam vistas com pouca frequência.

```
C9400#show spanning-tree vlan 100 detail
```

```
VLAN0100 is executing the rstp compatible Spanning Tree protocol
Bridge Identifier has priority 32768, sysid 10, address 2c5a.0f1c.28c0
Configured hello time 2, max age 20, forward delay 15, transmit hold-count 6
Current root has priority 32868, address 2c5a.0f1c.5300
Root port is 2473 (Port-channell), cost of root path is 4
Topology change flag not set, detected flag not set
Number of topology changes 1 last change occurred 2w6d ago
    from Port-channell
Times:  hold 1, topology change 35, notification 2
        hello 2, max age 20, forward delay 15
Timers: hello 0, topology change 0, notification 0, aging 300
```

```
--snip--
```

## Programação de encaminhamento L2

```
C9400#show etherchannel summary
```

```
--snip--
```

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/13(P) Gi5/0/21(P)

```
C9400#ping 100.100.900.53
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 100.100.900.53, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/4/5 ms
```

```
C9400#show mac address-table dynamic vlan 100
```

```
Mac Address Table
```

```
-----
```

Vlan	Mac Address	Type	Ports
100	0000.0200.0800	DYNAMIC	Gi1/0/1
100	20bb.c05e.5318	DYNAMIC	Po1
100	20bb.c05e.5351	DYNAMIC	Po1

```
Total Mac Addresses for this criterion: 3
```

## Programação de software

Nos próximos exemplos de saída, o RP programa o FP, o FP programa o FED, o FED e, finalmente, programa o hardware ASIC de encaminhamento do supervisor. As entradas MAC do software RP são armazenadas como objetos no banco de dados de objetos e as entradas MAC do software FP são armazenadas como objetos assíncronos no banco de dados de objetos.

```
C9400#show platform software matm rp active mac 20bb.c05e.5351 1 100 ---> 100 = vlan
Tbl_Type  Tbl_ID    MAC_Address  Type  Ports  AOM_ID/OM_PTR
```

MAT\_VLAN 100 20bb.c05e.5351 1 1 OM: 0x3700860010  
List of Ports: 748

C9400#show platform software interface rp active brief  
Forwarding Manager Interfaces Information

Name	ID	QFP ID
Null0	1	0
GigabitEthernet1/0/1	7	0
GigabitEthernet1/0/2	8	0
GigabitEthernet1/0/3	9	0
-snip-		
Port-channel1	748	0
-snip-		

C9400#show platform software matm fp active mac 20bb.c05e.5351  
Tbl\_Type Tbl\_ID MAC\_Address Type Ports AOM\_ID/OM\_PTR  
MAT\_VLAN 100 20bb.c05e.5351 1 1 6567 created  
List of Ports: 748

C9400#show platform software object-manager fp active object 6567  
Object identifier: 6567  
Description: matm mac entry type VLAN, id 100, 20bb.c05e.5351  
Status: Done, Epoch: 0, Client data: 0x799633f8

## Programação de hardware - Método 1

C9400#show platform software fed active matm macTable vlan 100  
VLAN MAC Type Seq# macHandle siHandle diHandle \*a\_time \*e\_time ports  
100 2c5a.0f1c.28e1 0X8002 0 0x7fe5c5eaf1c8 0x7fe5c5924f38 0x0 0 0  
Vlan100  
100 20bb.c05e.5351 0X1 589 0x7fe5c6b03d68 0x7fe5c6865f78 0x7fe51001b458 300 1  
Port-channel1  
100 0000.0200.0800 0X1 610 0x7fe5c6b07888 0x7fe5c6b076e8 0x7fe5c5972ce8 300 1  
GigabitEthernet1/0/1  
Total Mac number of addresses:: 3  
\*a\_time=aging\_time(secs) \*e\_time=total\_elapsed\_time(secs)

### Type:

<b>MAT_DYNAMIC_ADDR</b>	<b>0x1</b>	<b>MAT_STATIC_ADDR</b>	<b>0x2</b> ---> <b>Type = dynamically learned MAC</b>
<b>address entry</b>			
MAT_CPU_ADDR	0x4	MAT_DISCARD_ADDR	0x8
MAT_ALL_VLANS	0x10	MAT_NO_FORWARD	0x20
MAT_IPMULT_ADDR	0x40	MAT_RESYNC	0x80
MAT_DO_NOT_AGE	0x100	MAT_SECURE_ADDR	0x200
MAT_NO_PORT	0x400	MAT_DROP_ADDR	0x800
MAT_DUP_ADDR	0x1000	MAT_NULL_DESTINATION	0x2000
MAT_DOT1X_ADDR	0x4000	MAT_ROUTER_ADDR	0x8000
MAT_WIRELESS_ADDR	0x10000	MAT_SECURE_CFG_ADDR	0x20000
MAT_OPQ_DATA_PRESENT	0x40000	MAT_WIRED_TUNNEL_ADDR	0x80000
MAT_DLR_ADDR	0x100000	MAT_MRP_ADDR	0x200000
MAT_MSRRP_ADDR	0x400000	MAT_LISP_LOCAL_ADDR	0x800000
MAT_LISP_REMOTE_ADDR	0x1000000	MAT_VPLS_ADDR	0x2000000

## programação macHandle

Acrônimo/Termo Definição

vlan:10 MVID 10. A VLAN 100 usa o ID de VLAN mapeado (MVID) 10 internamente dentro do swit  
gpn:1104 Número de porta global do canal de porta 1.  
mac:0x20bbc Endereço MAC 20bb.c05e.5351  
05e5351

Este é um exemplo de saída do macHandle Programming:

```
C9400#show platform hardware fed active fwd-asic abstraction print-resource-handle
0x7fe5c6b03d68 1
Handle:0x7fe5c6b03d68 Res-Type:ASIC_RSC_HASH_TCAM Res-Switch-Num:0 Asic-Num:255 Feature-
ID:AL_FID_L2 Lkp-ftr-id:LKP_FEAT_L2_SRC_MAC_VLAN ref_count:1
priv_r/priv_si Handle: (nil)Hardware Indices/Handles: handle [ASIC: 0]: 0x7fe5c6aed898 handle
[ASIC: 1]: 0x7fe5c6b00fd8 handle [ASIC: 2]: 0x7fe5c6858208
Features sharing this resource:Cookie length: 12
5e c0 bb 20 51 53 0a 80 07 00 00 00
```

Detailed Resource Information (ASIC#0)

```
-----
Number of HTM Entries: 1
Entry 0: (handle 0x7fe5c6aed898) Abs_hash_index: 294 KEY - vlan:10 mac:0x20bbc05e5351 l3_if:0
gpn:1104 epoch:0 static:0 flood_en: 0 vlan_lead_wless_flood_en: 0 client_home_asic: 0 MASK -
vlan:0 mac:0x0 l3_if:0 gpn:0 epoch:0 static:0 flood_en:0 vlan_lead_wless_flood_en: 0
client_home_asic: 0 SRC_AD - need_to_learn:0 lrn_v:0 catchall:0 static_mac:0 chain_ptr_v:0
chain_ptr: 0 static_entry_v:0 auth_state:0 auth_mode:0 auth_behavior_tag:0 traf_m:0 is_src_ce:0
DST_AD - si:0xcd bridge:0 replicate:0 blk_fwd_o:0 v4_rmac:0 v6_rmac:0 catchall:0 ign_src_lrn:0
port_mask_o:0 afd_cli_f:0 afd_lbl:0 prio:3 dest_mod_idx:0 destined_to_us:0 pv_trunk:1 smr:0
Detailed Resource Information (ASIC#1) --snip-- Detailed Resource Information (ASIC#2) --snip--
```

C9400#show platform software fed active vlan 100

VLAN Fed Information

Vlan Id	IF Id	LE Handle	STP Handle	L3 IF Handle	SVI IF ID
MVID					
100	0x0000000000420011	0x00007fe5c4616ef8	0x00007fe5c4617778	0x00007fe5c50dac28	0x00000000000002ea 10

C9400#show platform software fed active ifm mappings etherchannel

Mappings Table

Chan	Interface	IF_ID
1	Port-channell	0x000002ec

C9400#show platform software fed active ifm if-id 0x000002ec <-- IF\_ID from previous output

```
Interface IF_ID : 0x00000000000002ec
Interface Name : Port-channell
Interface Block Pointer : 0x7fe5c685df98
Interface State : READY
Interface Status : ADD, UPD
Interface Ref-Cnt : 5
Interface Type : ETHERCHANNEL
Port Type : SWITCH PORT
Channel Number : 1
SNMP IF Index : 720
Port Handle : 0x50002f6
#Of Active Ports : 2
Base GPN : 1104
```





Detailed Resource Information (ASIC#0) ----> ASIC instance 0 = Supervisor ASIC 0, core 0  
-----

Station Index (SI) [0xcd]

**RI = 0x29** -----> Rewrite index (no MAC rewrite for L2 forwarding)

**DI = 0x51c2** -----> Destination index = outgoing interface

stationTableGenericLabel = 0

stationFdConstructionLabel = 0

lookupSkipIdIndex = 0

rcpServiceId = 0

dejaVuPreCheckEn = 0x1

Replication Bitmap: LD RD CD

Detailed Resource Information (ASIC#1) ----> ASIC instance 1 = Supervisor ASIC 0, core 1

--snip--

Detailed Resource Information (ASIC#2) ----> ASIC instance 2 = Supervisor ASIC 1, core 0

--snip--

Detailed Resource Information (ASIC#3) ----> ASIC instance 3 = Supervisor ASIC 1, core 1

--snip--

Detailed Resource Information (ASIC#4) ----> ASIC instance 4 = Supervisor ASIC 2, core 0

--snip--

Detailed Resource Information (ASIC#5) ----> ASIC instance 5 = Supervisor ASIC 2, core 1

--snip--

C9400#show platform hardware fed active fwd-asic resource asic all destination-index range  
0x51c2 0x51c2

ASIC#0:

--snip--

ASIC#1:

--snip--

**ASIC#2: -----> ASIC Instance 2 = Supervisor ASIC 1, core 0**

Destination Index (DI) [0x51c2]

portMap = 0x00000000 00001000 ----> binary 0001 0000 0000 0000 = Port 12 (see next command  
output)

cmil = 0 (read right to left, zero based)

rcpPortMap = 0

CPU Map Index (CMI) [0]

ctiLo0 = 0

ctiLo1 = 0

ctiLo2 = 0

cpuQNum0 = 0

cpuQNum1 = 0

cpuQNum2 = 0

npuIndex = 0

stripSeg = 0

copySeg = 0

**ASIC#3: -----> ASIC instance 3 = Supervisor ASIC 1, core 1**

Destination Index (DI) [0x51c2]

portMap = 0x00000000 00100000 ----> binary 0001 0000 0000 0000 0000 0000 = Port 20 (see next  
command output)

cmil = 0 (read right to left, zero based)

rcpPortMap = 0

CPU Map Index (CMI) [0]

ctiLo0 = 0

ctiLo1 = 0

ctiLo2 = 0

cpuQNum0 = 0

cpuQNum1 = 0

cpuQNum2 = 0

npuIndex = 0

```
stripSeg = 0
copySeg = 0
```

```
ASIC#4:
--snip--
ASIC#5:
--snip--
```

C9400#**show platform software fed active ifm mappings**

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
GigabitEthernet1/0/1	0x7	2	1	0	0	0	4	4	1	101	NIF	Y
GigabitEthernet1/0/2	0x8	2	1	0	1	1	4	4	2	102	NIF	Y
--snip--												
GigabitEthernet1/0/13	0x13	2	1	0	12	4	0	0	13	1105	NIF	Y
--snip--												
GigabitEthernet5/0/21	0x8f	3	1	1	20	4	5	5	21	1104	NIF	Y
--snip--												

C9400#**show etherchannel summary**

```
--snip--
Group  Port-channel  Protocol  Ports
-----+-----+-----+-----
1      Po1(SU)          LACP      Gi1/0/13(P) Gi5/0/21(P)
```

Não há informações de regravação de MAC esperadas, pois essa é uma entrada de encaminhamento de MAC da camada 2.

C9400#**show platform hardware fed active fwd-asic resource asic all rewrite-index range 0x29 0x29 1**

```
ASIC#0:

Rewrite Data Table Entry,
ASIC#:0, rewrite_type:1, RI:41 ----> dec 41 = hex 0x29
```

```
MAC Addr:
MAC Addr: 20:bb:c0:5e:53:51,
L3IF LE Index 111
```

```
ASIC#1:

Rewrite Data Table Entry,
ASIC#:1, rewrite_type:1, RI:41
```

```
MAC Addr:
MAC Addr: 20:bb:c0:5e:53:51,
L3IF LE Index 111
```

```
ASIC#2:
--snip--
ASIC#3:
--snip--
ASIC#4:
--snip--
ASIC#5:
--snip--
```

C9400#**show mac address-table address 20bb.c05e.5351**

```
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
```

```
-----
100      20bb.c05e.5351      DYNAMIC      Po1
Total Mac Addresses for this criterion: 1
```

## Programação de diHandle

Acrônimo	Definição
diHandle	identificador de índice de destino. Essas são as informações da interface de saída.

```
C9400#show platform hardware fed active fwd-asic abstraction print-resource-handle
0x7fe51001b458 1
Handle:0x7fe51001b458 Res-Type:ASIC_RSC_DI Res-Switch-Num:0 Asic-Num:255 Feature-
ID:AL_FID_INVALID Lkp-ftr-id:LKP_FEAT_INVALID ref_count:21
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index0:0x51c2 mtu_index/l3u_ri_index0:0x0
index1:0x51c2 mtu_index/l3u_ri_index1:0x0 index2:0x51c2 mtu_index/l3u_ri_index2:0x0
index3:0x51c2 mtu_index/l3u_ri_index3:0x0 index4:0x51c2 mtu_index/l3u_ri_index4:0x0
index5:0x51c2 mtu_index/l3u_ri_index5:0x0
Features sharing this resource:Cookie length: 8
01 00 00 00 c2 51 00 00
```

```
Detailed Resource Information (ASIC#0)
--snip--
Detailed Resource Information (ASIC#1)
--snip--
```

```
Detailed Resource Information (ASIC#2) ----> ASIC Instance 2 = Supervisor ASIC 1, core 0
```

```
-----
Destination Index (DI) [0x51c2]
portMap = 0x00000000 00001000 -----> binary 0001 0000 0000 0000 = Port 12 (see next
command output)
cmil = 0 (read right to left, zero based)
rcpPortMap = 0
CPU Map Index (CMI) [0]
ctiLo0 = 0
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
stripSeg = 0
copySeg = 0
```

```
Detailed Resource Information (ASIC#3) ----> ASIC Instance 3 = Supervisor ASIC 1, core 1
```

```
-----
Destination Index (DI) [0x51c2]
portMap = 0x00000000 00100000 ----> binary 0001 0000 0000 0000 0000 0000 = Port 20 (see next
command output)
cmil = 0 (read right to left, zero based)
rcpPortMap = 0
CPU Map Index (CMI) [0]
ctiLo0 = 0
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
stripSeg = 0
copySeg = 0
```

Detailed Resource Information (ASIC#4) --snip-- Detailed Resource Information (ASIC#5) --snip--

C9400#show platform software fed active ifm mappings

```
Interface IF_ID Inst Asic Core Port SubPort Mac Cntx LPN GPN Type Active GigabitEthernet1/0/1
0x7 2 1 0 0 0 4 4 1 101 NIF Y GigabitEthernet1/0/2 0x8 2 1 0 1 1 4 4 2 102 NIF Y --snip--
GigabitEthernet1/0/13 0x13 2 1 0 12 4 0 0 13 1105 NIF Y --snip-- GigabitEthernet5/0/21 0x8f 3 1
1 20 4 5 5 21 1104 NIF Y --snip--
```

C9400#show etherchannel summary

--snip--

```
Group Port-channel Protocol Ports
```

```
-----+-----+-----+-----
1 Po1(SU) LACP Gi1/0/13(P) Gi5/0/21(P)
```

## Programação de hardware - Método 2

**Acrônimo/Termo Definição**

vlan:10 MVID 10. A VLAN 100 usa o ID de VLAN mapeado (MVID) 10 internamente dentro do switch.

gpn:1104 Número de porta global do canal de porta 1.

mac:0x20bbc05e5351 Endereço MAC 20bb.c05e.5351

Exemplo de saída do método de programação de hardware 2:

C9400#show platform hardware fed active matm macTable vlan 100

--snip--

HEAD: MAC address 20bb.c05e.5351 in VLAN 100

KEY: vlan 10, mac 0x20bbc05e5351, l3\_if 0, gpn 1104, epoch 0, static 0, flood\_en 0, vlan\_lead\_wless\_flood\_en 0, client\_home\_asic 0

MASK: vlan 0, mac 0x0, l3\_if 0, gpn 0, epoch 0, static 0, flood\_en 0, vlan\_lead\_wless\_flood\_en 0, client\_home\_asic 0

SRC\_AD: need\_to\_learn 0, lrn\_v 0, catchall 0, static\_mac 0, chain\_ptr\_v 0, chain\_ptr 0, static\_entry\_v 0, auth\_state 0, auth\_mode 0, traf\_mode 0, is\_src\_ce 0

DST\_AD: si 0xc7, bridge 0, replicate 0, blk\_fwd\_o 0, v4\_mac 0, v6\_mac 0, catchall 0, ign\_src\_lrn 0, port\_mask\_o 0, afd\_cli\_f 0, afd\_lbl 0, priority 3, dest\_mod\_idx 0, destined\_to\_us 0, pv\_trunk 1

--snip--

C9400#show platform software fed active vlan 100

VLAN Fed Information

```
Vlan Id IF Id LE Handle STP Handle L3 IF Handle SVI IF ID
MVID
```

```
-----
100 0x0000000000420011 0x00007fe5c4616ef8 0x00007fe5c4617778 0x00007fe5c50dac28
0x000000000000002ea 10
```

C9400#show platform software fed active ifm mappings etherchannel

Mappings Table

```
Chan Interface IF_ID
-----
1 Port-channel1 0x000002ec
```

--snip--

```

C9400#show platform software fed active ifm if-id 0x000002ec
Interface IF_ID : 0x00000000000002ec
Interface Name : Port-channel1
Interface Block Pointer : 0x7fe5c685df98
Interface State : READY
Interface Status : ADD, UPD
Interface Ref-Cnt : 5
Interface Type : ETHERCHANNEL
Port Type : SWITCH PORT
Channel Number : 1
SNMP IF Index : 720
Port Handle : 0x50002f6
#Of Active Ports : 2
Base GPN : 1104
Index[2] : 0000000000000013
Index[3] : 000000000000008f

```

```

Port Information
Handle ..... [0x50002f6]
Type ..... [L2-Ethchannel]
Identifier ..... [0x2ec]
Unit ..... [1]
Port Logical Subblock
L3IF_LE handle .... [0x0]
Num physical port . [2]
GPN Base ..... [1104]
--snip--

```

**Note:** Se a interface na qual o mac aprendeu era uma única interface em vez de um canal de porta, o próximo comando é usado para determinar o mapeamento de gpn para a interface:

```

C9400#show platform software fed active ifm mappings gpn
Mappings Table

```

GPN	Interface	IF_ID
101	GigabitEthernet1/0/1	0x00000007
102	GigabitEthernet1/0/2	0x00000008
103	GigabitEthernet1/0/3	0x00000009

```

--snip--

```

## Utilização de TCAM

Verifique a utilização do TCAM para as entradas de endereço MAC em cada instância do Supervisor ASIC para garantir que o switch não fique sem espaço de TCAM para armazenar entradas no hardware.

```

C9400#show platform hardware fed active fwd-asic resource tcam utilization

```

```

CAM Utilization for ASIC Instance [0]

```

```

--snip--

```

```

CAM Utilization for ASIC Instance [1]

```

```

--snip--

```

```

CAM Utilization for ASIC Instance [2]

```

```

--snip--

```

```

CAM Utilization for ASIC Instance [3]---> ASIC instance 3 = Supervisor ASIC 1, Core 1

```

```

Table Max Values Used Values -----

```

```

----- Unicast MAC addresses 65536/1024 13/1 -----> prefix/mask

```

IGMP and Multicast groups	16384/1024	0/7
L2 Multicast groups	16384/1024	1/9
Directly or indirectly connected routes	49152/65536	0/0
NAT/PAT SA address and Port	0	0
QoS Access Control Entries	18432	34
Security Access Control Entries	18432	0
Ingress Netflow ACEs	1024	0
Policy Based Routing ACEs	2048	9
Egress Netflow ACEs	2048	8
Input Microflow policer ACEs	0	0
Output Microflow policer ACEs	0	0
Flow SPAN ACEs	1024	13
Control Plane Entries	1024	0
Tunnels	1024	0
Lisp Instance Mapping Entries	1024	0
Input Security Associations	512	3
Output Security Associations and Policies	512	0
SGT_DGT	8192/512	0/0
CLIENT_LE	4096/256	2/0
INPUT_GROUP_LE	1024	0
OUTPUT_GROUP_LE	1024	0
Macsec SPD	256	0

CAM Utilization for ASIC Instance [4]  
--snip--  
CAM Utilization for ASIC Instance [5]  
--snip--

## Programação de hardware bem-sucedida

Todos os recursos (seja um endereço mac, uma interface, uma vlan, etc.) são armazenados no banco de dados de objetos e programados no hardware como objetos.

O RP programa o FP, o FP programa o FED e o FED e, por fim, programa o hardware ASIC de encaminhamento do supervisor. As entradas de software RP são armazenadas como objetos no banco de dados de objetos e as entradas de software FP são armazenadas como objetos assíncronos no banco de dados de objetos.

Quando o FP programa o FED (que, por sua vez, programa o Supervisor Forwarding ASIC), o FED envia uma confirmação ao FP. Em seguida, o FP o encaminha ao RP para indicar que a programação de hardware foi concluída com êxito. Se a programação de hardware do FED estiver ausente ou incorreta, você poderá usar este próximo comando para verificar problemas e/ou confirmações.

```
C9400#show platform software object-manager fp active statistics
Forwarding Manager Asynchronous Object Manager Statistics
```

```
Object update: Pending-issue: 0, Pending-acknowledgement: 0
Batch begin:   Pending-issue: 0, Pending-acknowledgement: 0
Batch end:    Pending-issue: 0, Pending-acknowledgement: 0
Command:      Pending-acknowledgement: 0
Total-objects: 3269
Stale-objects: 0
Resolve-objects: 0
Error-objects: 0
Paused-types: 0
```

Se o comando anterior mostrar objetos diferentes de zero no estado de emissão pendente, use

este comando para localizar o número de objeto envolvido:

```
C9400#show platform software object-manager fp active pending-issue-update
```

Em seguida, use este comando para determinar o processo travado associado ao número do objeto:

```
C9400#show platform software object-manager fp active object {object#}
```

No lado RP, use este comando para verificar se há exclusão pendente (Pend da Dell) de um objeto que o FP não reconheceu.

```
C9400#show platform software object-manager rp active object-type-info
```

```
Object type Name Count Del Pend Layer -----  
----- CC cc 5 0 2 SPA spa 0 0 4 PORT_DPIDB port_dpidx 164 0 10 CHANNEL_DPIDB  
channel_dpidx 0 0 12 VIRTUAL_DPIDB virtual_dpidx 503 0 13 SW_DPIDB sw_dpidx 0 0 17 VLAN vlan 0 0  
19  
--snip--
```

## Verificação de integridade

### Política e tráfego do plano de controle

Verifique se o CoPP (Control Plane Policy) cai no hardware-UADP 2.0 para tráfego direcionado para o software-CPU. Isso pode afetar o aprendizado MAC e a estabilidade do Spanning Tree.

```
C9400#show policy-map control-plane
```

```
Control Plane
```

```
Service-policy input: system-cpp-policy
```

```
--snip--
```

```
Class-map: system-cpp-police-sw-forward (match-any)  
  0 packets, 0 bytes  
  5 minute offered rate 0000 bps, drop rate 0000 bps  
  Match: none  
  police:  
    rate 1000 pps, burst 244 packets  
    conformed 1298 bytes; actions:  
      transmit  
    exceeded 0 bytes; actions:  
      drop
```

```
--snip--
```

```
Class-map: system-cpp-police-l2-control (match-any)  
  0 packets, 0 bytes  
  5 minute offered rate 0000 bps, drop rate 0000 bps  
  Match: none  
  police:  
    rate 500 pps, burst 122 packets  
    conformed 239197001 bytes; actions:  
      transmit  
    exceeded 0 bytes; actions:  
      drop
```



--snip--

```
Class-map: system-cpp-default (match-any)
  0 packets, 0 bytes
  5 minute offered rate 0000 bps, drop rate 0000 bps
  Match: none
  police:
    rate 1000 pps, burst 244 packets
    conformed 0 bytes; actions:
      transmit
    exceeded 0 bytes; actions:
      drop

Class-map: class-default (match-any)
  0 packets, 0 bytes
  5 minute offered rate 0000 bps, drop rate 0000 bps
  Match: any
```

A mesma saída de CoPP do exemplo anterior é mostrada aqui em um formato mais granular e mais simples de ler (compactado).

C9400#show platform hardware fed active qos queue stats internal cpu policer

CPU Queue Statistics

```
=====
                                (default) (set)
QId PlcIdx Queue Name           Enabled Rate Rate Queue Queue
                                Drop(Bytes) Drop(Frames)
0   11   DOT1X Auth                    Yes  1000 1000 0   0
1   1    L2 Control                    Yes  2000 400  0   0
2   14   Forus traffic                 Yes  1000 1000 0   0
3   0    ICMP GEN                      Yes  600  600  0   0
4   2    Routing Control              Yes  5400 1800 0   0
5   14   Forus Address resolution     Yes  1000 1000 0   0
6   0    ICMP Redirect                Yes  600  600  0   0
7   16   Unused                      Yes  1000 1000 0   0
8   4    L2 LVX Cont Pack            Yes  1000 1000 0   0
9   16   EWLC Control                 Yes  1000 1000 0   0
10  16   EWLC Data                   Yes  1000 1000 0   0
11  13   L2 LVX Data Pack            Yes  1000 1000 0   0
12  0    BROADCAST                   Yes  600  600  0   0
13  10   Learning cache ovfl        Yes  100  200  0   0
14  13   Sw forwarding               Yes  1000 1000 0   0
15  8    Topology Control           Yes 13000 13000 0   0
16  12   Proto Snooping             Yes  2000 2000 0   0
17  16   DHCP Snooping              Yes  1000 1000 0   0
18  9    Transit Traffic            Yes  500  400  0   0
19  10   RPF Failed                  Yes  100  200  0   0
20  15   MCAST END STATION          Yes  2000 2000 0   0
21  13   LOGGING                    Yes  1000 1000 0   0
22  7    Punt Webauth                Yes  1000 1000 0   0
23  10   Crypto Control             Yes  100  200  0   0
24  10   Exception                   Yes  100  200  0   0
25  3    General Punt                Yes  200  200  0   0
26  10   NFL SAMPLED DATA          Yes  100  200  0   0
27  2    Low Latency                 Yes  5400 1800 0   0
28  10   EGR Exception              Yes  100  200  0   0
29  5    Stackwise Virtual Control   No   8000 8000 0   0
30  9    MCAST Data                  Yes  500  400  0   0
31  10   Gold Pkt                    Yes  100  200  0   0
=====
```

\* NOTE: CPU queue policer rates are configured to the closest hardware supported value

CPU Queue Policer Statistics

```
=====
Policer      Policer Accept  Policer Accept  Policer Drop  Policer Drop
  Index      Bytes          Frames          Bytes          Frames
-----
0            3132           36              0              0
1          239197001  721952          0              0
2          123004776  978818          0              0
3            0           0                0              0
4            0           0                0              0
5            0           0                0              0
6            0           0                0              0
7            0           0                0              0
8           1024           16              0              0
9            0           0                0              0
10          13600           200              0              0
11           0           0                0              0
12           0           0                0              0
13          1298           3                0              0
14          80520          9158             0              0
15          2189268      23733            0              0
16           0           0                0              0
17           0           0                0              0
```

CPP Classes to queue map

```
=====
PlcIdx CPP Class                               : Queues
-----
0      system-cpp-police-data                   : ICMP GEN/BROADCAST/ICMP Redirect/
10     system-cpp-police-sys-data : Learning cache ovfl/Crypto Control/Exception/EGR Exception/NFL
SAMPLED DATA/Gold Pkt/RPF Failed/ 13 system-cpp-police-sw-forward : Sw forwarding/LOGGING/L2 LVX
Data Pack/ 9 system-cpp-police-multicast : Transit Traffic/MCAST Data/ 15 system-cpp-police-
multicast-end-station : MCAST END STATION / 7 system-cpp-police-punt-webauth : Punt Webauth/ 1
system-cpp-police-l2-control : L2 Control/ 5 system-cpp-police-stackwise-virt-control :
Stackwise Virtual Control/ 2 system-cpp-police-routing-control : Routing Control/Low Latency/ 3
system-cpp-police-control-low-priority : General Punt/ 4 system-cpp-police-l2lvx-control : L2
LVX Cont Pack/ 8 system-cpp-police-topology-control : Topology Control/ 11 system-cpp-police-
dot1x-auth : DOT1X Auth/ 12 system-cpp-police-protocol-snooping : Proto Snooping/ 14 system-cpp-
police-forus : Forus Address resolution/Forus traffic/ 5 system-cpp-police-stackwise-virt-
control : Stackwise Virtual Control/ 16 system-cpp-default : DHCP Snooping/Unused/EWLC
Control/EWLC Data/
```

Verifique as estatísticas do caminho de punção da CPU (hardware-UADP 2.0 em direção à CPU de software) da perspectiva do software (CPU).

```
C9400#show platform software infrastructure lsmpi
LSMPI interface internal stats:
enabled=0, disabled=0, throttled=0, unthrottled=0, state is ready
Input Buffers = 8801257
Output Buffers = 5506129
rxdone count = 8801257
txdone count = 5506128
Rx no particletype count = 0
Tx no particletype count = 0
Txbuf from shadow count = 0
No start of packet = 0
No end of packet = 0
```

Punt drop stats:  
 Bad version 0  
 Bad type 0  
 Had feature header 0  
 Had platform header 0  
 Feature header missing 0  
 Common header mismatch 0  
 Bad total length 0  
 Bad packet length 0  
 Bad network offset 0  
 Not punt header 0  
 Unknown link type 0  
 No swidb 0  
 Bad ESS feature header 0  
 No ESS feature 0  
 No SSLVPN feature 0  
 No PPP bridge feature 0  
 Punt For PPP bridge type packets 0  
 Punt For Us type unknown 0  
 EPC CP RX Pkt cleansed 0  
 Punt cause out of range 0  
 IOSXE-RP Punt packet causes:  
     42879 Layer2 control and legacy packets  
   3644168 ARP request or response packets  
     7584 For-us data packets  
     1794 Mcast Directly Connected Source packets  
     1573 Mcast PIM signaling packets  
   750076 For-us control packets  
 38058 Layer2 bridge domain data packet packets  
   3823736 Layer2 control protocols packets

FOR\_US Control IPv4 protcol stats:

750076 [proto=0] packets

Packet histogram(500 bytes/bin), avg size in 125, out 126:

Pak-Size	In-Count	Out-Count
0+:	8228322	5207592
500+:	41355	1717
1000+:	4331	2402
1500+:	35860	20017

**Lsmpl11/3 is up, line protocol is up <-- CPU interface**

Hardware is LSMPI

MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,  
 reliability 255/255, txload 1/255, rxload 1/255

Encapsulation ARPA, loopback not set

Keepalive not set

Unknown, Unknown, media type is unknown media type

output flow-control is unsupported, input flow-control is unsupported

ARP type: ARPA, ARP Timeout 04:00:00

Last input never, output never, output hang never

Last clearing of "show interface" counters never

Input queue: 0/1500/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: fifo

Output queue: 0/40 (size/max)

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

8309868 packets input, 0 bytes, 0 no buffer

Received 0 broadcasts (0 IP multicasts)

0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort

0 watchdog, 0 multicast, 0 pause input

5231728 packets output, [659535525](#) bytes, 0 underruns 0 output errors, 0 collisions, 0

interface resets 0 unknown protocol drops 0 output buffer failures, 0 output buffers swapped out

C9400#show platform software infrastructure lsmpi punt

LSMPI punt statistics

Total packets consumed: 876  
Total packets forwarded: 8468766  
First frag packets: 0  
Total packets consumed & forwarded: 0

Cause	Total	Total	Length	Dot1q encap	
Other	SKB	consumed	forwarded	error	exceeded
linktype	invalid				
MPLS ICMP Can't Fragment		0	0	0	0
0					
IPv4 Options		0	0	0	0
0					
Layer2 control and legacy		0	0	0	0
0					
PPP Control		0	0	0	0
0					
CLNS IS-IS Control		0	0	0	0
0					
HDLC keepalives		0	0	0	0
0					

--snip--

Verifique as estatísticas do caminho de injeção da CPU (software-CPU em direção ao hardware-supervisor) da perspectiva do software (CPU).

C9400#show platform software infrastructure inject

Statistics for L3 injected packets:

5233473 total inject pak, 3 failed  
0 sent, 859329 prerouted  
0 non-CEF capable, 855296 non-unicast  
859826 IP, 0 IPv6  
0 MPLS, 0 Non-IP Tunnel  
0 UDLR tunnel, 0 P2MP replicated mcast  
0 Non-IP Fastswitched over Tunnel, 4373497 legacy pak path  
0 Other packet  
0 IP fragmented  
644 normal, 391 nexthop  
858788 adjacency, 150 feature  
0 undefined  
3 pak find no adj, 0 no adj-id  
137322 sb alloc, 856085 sb local  
0 p2mcast failed count 0 p2mcast enqueue fail  
0 unicast dhc  
0 mobile ip  
0 IPv6 NA  
0 IPv6 NS  
0 Transport failed cases  
0 Grow packet buffer  
per feature packet inject statistics  
150 Feature multicast  
0 Feature Edge Switching Service  
0 Feature Session Border Controller  
0 Feature interrupt level  
0 Feature use outbound interface  
0 Feature interrupt level with OCE  
0 Feature ICMPv6 error message

```

0 Feature Session Border Controller media packet injection
0 Feature Tunnel Ethernet over GRE
0 Feature Secure Socket Layer Virtual Private Network
0 Feature EPC Wireshark injecting packets

```

```

Statistics for L2 injected packets:
0 total L2 inject pak, 0 failed
0 total BD inject pak, 0 failed
0 total EFP inject pak, 0 failed
0 total VLAN inject pak, 0 failed

```

Verifique as estatísticas do caminho de injeção/punção da CPU a partir de uma perspectiva de FED (UADP 2.0).

```

C9400#show platform software fed active lsmpi stat
LSMPI Statistics

```

```

-----
Transmit: -----> FED transmit = FED (Supervisor) punt to CPU
Packet Count      : 8469445
Bytes Count       : 1055390613
particle Count    : 8951009
particle with App : 7258
Ring Full Error   : 0
No Buff Error     : 0
TX Ring Free     : 2047
TX Ring Busy     : 0
TX Ring Size     : 2048
TXDone Ring Free : 6816
TXDone Ring Busy : 9567
TXDone Ring Size : 16384

Receive: -----> FED receive = CPU inject to FED (Supervisor)
Packet Count      : 5450099
Bytes Count       : 675084903 Particle Count : 5695697 Particles with App : 4294966854 RX
Done Count : 5696139 No SOP : 0 No EOP : 0 Not Enough Buf : 0 Max Not Enough Buf : 0 RX Ring
Free : 4095 RX Ring Busy : 0 RX Ring Size : 4096 RXDone Ring Free : 8191 RXDone Ring Busy : 0
RXDone Ring Size : 8192 -----

```

Verifique as estatísticas do caminho de punção da CPU (hardware-supervisor para a CPU de software) a partir de uma perspectiva de FED (Supervisor).

```

C9400#show platform software fed active punt cause summary
Statistics for all causes

```

Cause	Cause Info	Rcvd	Dropped
7	ARP request or response	3644168	0
11	For-us data	1524	0
12	Mcast Directly Connected Source	1794	0
25	Mcast PIM signaling	1573	0
55	For-us control	750461	0
58	Layer2 bridge domain data packet	38058	0
96	Layer2 control protocols	3825228	0

Verifique a integridade das 31 filas individuais de CPU punt do ponto de vista do FED (Supervisor).

C9400#show platform software fed active cpu-interface

queue	retrieved	dropped	invalid	hol-block
Routing Protocol	790844	0	0	0
L2 Protocol	2774488	0	0	0
sw forwarding	0	0	0	0
broadcast	0	0	0	0
icmp	0	0	0	0
icmp redirect	0	0	0	0
logging	0	0	0	0
rpf-fail	1573	0	0	0
DOT1X authentication	0	0	0	0
Forus Traffic	1524	0	0	0
Forus Resolution	3644192	0	0	0
Wireless q5	0	0	0	0
Wireless q1	0	0	0	0
Wireless q2	0	0	0	0
Wireless q3	0	0	0	0
Wireless q4	0	0	0	0
Learning cache	0	0	0	0
Topology control	1198807	0	0	0
Proto snooping	0	0	0	0
bfd Low latency	0	0	0	0
Transit Traffic	0	0	0	0
Multi End station	38058	0	0	0
Health Check	0	0	0	0
Health Check	0	0	0	0
Crypto control	0	0	0	0
Exception	0	0	0	0
General Punt	0	0	0	0
NFL sampled data	0	0	0	0
STG cache	0	0	0	0
EGR exception	0	0	0	0
FSS	0	0	0	0
Multicast data	1794	0	0	0

C9400#show platform software fed active punt cpuq all

Punt CPU Q Statistics

=====

-snip-

```

CPU Q Id           : 1
CPU Q Name        : CPU_Q_L2_CONTROL
Packets received from ASIC      : 2669864 -----> Packets received by the FED process from
the Supervisor forwarding ASICs
Send to IOSd total attempts    : 2669864 -----> Packets sent from the FED process to IOSd
Send to IOSd failed count      : 0
RX suspend count              : 0
RX unsuspend count            : 0
RX unsuspend send count       : 0
RX unsuspend send failed count : 0
RX consumed count             : 0
RX dropped count              : 0
RX non-active dropped count    : 0
RX conversion failure dropped  : 0
RX INTACK count               : 2243784
RX packets dq'd after intack   : 5074
    
```

```

Active RxQ event          : 2243785
RX spurious interrupt    : 322266

CPU Q Id                 : 2
CPU Q Name               : CPU_Q_FORUS_TRAFFIC
Packets received from ASIC : 1524
Send to IOSd total attempts : 1524
Send to IOSd failed count : 0
RX suspend count        : 0
RX unsuspend count     : 0
RX unsuspend send count : 0
RX unsuspend send failed count : 0
RX consumed count      : 0
RX dropped count       : 0
RX non-active dropped count : 0
RX conversion failure dropped : 0
RX INTACK count       : 1347
RX packets dq'd after intack : 8
Active RxQ event      : 1347
RX spurious interrupt : 38

```

-snip-

Verifique as estatísticas do caminho de injeção da CPU (software-CPU em direção ao hardware-supervisor) a partir de uma perspectiva de FED (Supervisor).

```

C9400#show platform software fed active inject cause summary
Statistics for all causes

```

Cause	Cause Info	Rcvd	Dropped
1	L2 control/legacy	4331682	0
2	QFP destination lookup	290	0
3	QFP IPv4/v6 nexthop lookup	391	0
7	QFP adjacency-id lookup	859393	265
8	Mcast specific inject packet	150	0
12	ARP request or response	601	0

Verifique a integridade das duas filas individuais de injeção de CPU a partir de uma perspectiva de FED (UADP 2.0).

```

C9400#show platform software fed active inject cpuq all
Inject CPU Q Statistics
=====

```

```

CPU Q Id           : 0
CPU Q Name      : TX_CPUQ_PRIO_LOW ---> low priority CPU inject queue
Packets received from IOSd : 168342
Enq to pkt driver total attempts : 168277
Enq to pkt driver failed count : 0
Count of TX CMPL received : 168277
TX suspend count    : 0
TX unsuspend count : 0
TX dropped count   : 265
TX punted count    : 0
TX App enq failed  : 0

CPU Q Id           : 7
CPU Q Name      : TX_CPUQ_PRIO_HI ---> high priority CPU inject queue
Packets received from IOSd : 5024664
Enq to pkt driver total attempts : 5024664

```

```
Enq to pkt driver failed count    : 0
Count of TX CMPL received         : 5024664
TX suspend count                  : 0
TX unsuspend count                 : 0
TX dropped count                   : 0
TX punted count                    : 0
TX App enq failed                  : 0
```

Stats for all txq:

```
-----
TX chunk malloc fail count       : 0
-----
```

## Estatísticas de eventos da tabela MAC

```
C9400#show platform software fed active matm stats
MATM counters
```

```
Total non-cpu mac entries        : 10
Mac Learn SPI Msg Count           : 0
Mac Learn SPI Err Count           : 0
Mac Delete SPI Msg Count          : 0
Mac Delete SPI Err Count          : 0
Mac Learn Count                   : 967
Mac Add Count                     : 989
Mac AL add Count                  : 971
Mac Del Count                     : 957
Mac AL Del Count                  : 961
Mac Move Count                   : 2 ----> MAC moves between interfaces (see details above)
Mac AL Move Count                 : 0
Mac Clear Count                   : 0
Mac Del all count                 : 6
Mac table create Count            : 9
Mac VP event Count                : 5
Mac Update info Count             : 0
Mac Vlan age config Event Count   : 0
Mac Vlan Link Event Count         : 6
Mac SVI linkEvent Count           : 3
Mac Bsync Event Count             : 0
Mac Isync Event Count             : 0
Mac Recon Start Count             : 0
Mac Recon Event Count             : 0
Mac IFM event Count               : 75
Mac FEC Event Count               : 0
Mac Aging Tick Count              : 0
Mac Retry event Count             : 0
Mac Hw Update Err Count           : 0
Mac In retryQ Count               : 0
```

```
C9400#configure terminal
```

```
C9400(config)#mac address-table notification ?
```

```
change      Enable/Disable MAC Notification feature on the switch
mac-move    Enable Mac Move Notification
threshold   Configure L2 Table monitoring
```

```
C9400(config)#mac address-table notification mac-move ----> enabled by default, syslog generated
for any MAC move (show logging)
```



```
C9400(config)#mac address-table notification change ?
  history-size  Number of MAC notifications to be stored
  interval      Interval between the MAC notifications
  <cr>         <cr>
```

```
C9400(config)#mac address-table notification change ---> disabled by default
```

```
C9400#show mac address-table notification mac-move
MAC Move Notification:  enabled
```

```
C9400#show mac address-table notification change
MAC Notification Feature is Enabled on the switch Interval between Notification Traps : 1 secs
Number of MAC Addresses Added : 0 Number of MAC Addresses Removed : 0 Number of Notifications
sent to NMS : 0 Maximum Number of entries configured in History Table : 1 Current History Table
Length : 0 MAC Notification Traps are Disabled History Table contents -----
```

## Quedas de exceção do UADP 2.0

Esse comando detalha qualquer razão pela qual um ASIC de encaminhamento UADP 2.0 descarta um pacote:

```
C9400#show platform hardware fed active fwd-asic drops exceptions
****EXCEPTION STATS ASIC INSTANCE 0 (asic/core 0/0)****
===== Asic/core |
NAME | prev | current | delta
===== 0 0
NO_EXCEPTION 0 0 0 0 IPV4_CHECKSUM_ERROR 0 0 0 0 ROUTED_AND_IP_OPTIONS_EXCEPTION 0 0 0 0
CTS_FILTERED_EXCEPTION 0 0 0 0 SIA_TTL_ZERO 0 0 0 0 ALLOW_NATIVE_EXCEPTION_COUNT 0 0 0 0
ALLOW_DOT1Q_EXCEPTION_COUNT 0 0 0 0 ALLOW_PRIORITY_TAGGED_EXCEPTION_COUNT 0 0 0 0
ALLOW_UNKNOWN_ETHER_TYPE_EXCEPTION 0 0 0 0 IP_SOURCE_GUARD_VIOLATION 0 0 0 0
SECURE_L3IF_LEARNING_VIOLATION 0 0 0 0 AUTH_DRIVEN_DROP 0 0 0 0 VLAN_LOADBALANCE_GROUP_DENY
0 0 0 0 RPF_UNICAST_FAIL 0 0 0 0 RPF_UNICAST_FAIL_SUPPRESS 0 0 0 0
RPF_UNICAST_CHECK_INCOMPLETE 0 0 0 0 RPF_MULTICAST_FAIL 0 0 0 0 PKT_DROP_COUNT 0 0 0 0
SOURCE_ROUTE_EXCEPTION 0 0 0 0 IGR_MISC_FATAL_ERROR 0 0 0 0 BLOCK_FORWARD 0 0 0 0
POLICER_DROP 0 0 0 0 DENY_ROUTE 0 0 0 0 DENY_BRIDGE 0 0 0 0 STATIC_MAC_VIOLATION 0 0 0 0
STATIC_IP_VIOLATION 0 0 0 0 FPM_DROP_PACKET 0 0 0 0 IGR_EXCEPTION_L4_ERROR 0 0 0 0
IGR_EXCEPTION_L5_ERROR 0 0 0 0 IGR_EXCEPTION_HARDWARE_PARSE_EXCEPTION 0 0 0 0
IGR_EXCEPTION_INVALID_VLAN_DROP 0 0 0 0 IGR_EXCEPTION_31 0 0 0 0
FRAGMENTING_IPV4_WITH_OPTIONS 0 0 0 0 FRAGMENTING_IPV6_WITH_EXTENSIONS 0 0 0 0 ICMP_REDIRECT
0 0 0 0 MTU_FAIL_PUNT_TO_CPU_NO_IP_UNREACHABLE 0 0 0 0
LINK_LOCAL_CHECK_FAIL_NO_IP_UNREACHABLE 0 0 0 0 IP_UNICAST_TTL_REACHED_ZERO 0 0 0 0
MISC_FATAL_ERROR 0 0 0 0 STP_OR_FLEXLINK_DROP 0 0 0 0 PROTECTED_PORT_DROP 0 0 0 0
PVLAN_ISOLATED_CHECK_FAILED 0 0 0 0 PVLAN_COMMUNITY_CHECK_FAILED 0 0 0 0
DEJA_VU_CHECK_FAILED 0 0 0 0 NOT_VLAN_LOAD_BALANCE_GROUP_ALLOWED 0 0 0 0 RSPAN_DROP 0 0 0 0
0 SPLIT_HORIZON_DROP 0 0 0 0 SYSTEM_TTL_DROP 0 0 0 0 PRUNED 0 0 0 0 DENY_NO_IP_UNREACHABLE
0 0 0 0 IP_MULTICAST_TTL_REACHED_ZERO 0 0 0 0 MTU_FAIL_DROP_BRIDGED 0 0 0 0
MTU_FAIL_DROP_BRIDGED_IP_ROUTED 0 0 0 0 MTU_FAIL_ERSPAN 0 0 0 0
LINK_LOCAL_CHECK_FAIL_L3M_VALID 0 0 0 0 DENY_NOT_NO_IP_UNREACHABLE 0 0 0 0
MTU_FAIL_PUNT_TO_CPU_NOT_NO_IP_UNREACHABLE 0 0 0 0 LINK_LOCAL_CHECK_FAIL_NOT_NO_IP_UNREACHABLE
0 0 0 0 COPY_TO_CPU 0 0 0 0 EGR_L3_ERROR 0 0 0 0 EGR_L4_ERROR 0 0 0 0 EGR_L5_ERROR 0 0 0
0 0 EGR_HARDWARE_PARSE_EXCEPTION 0 0 0 0 EGR_SHOW_FORWARD_DROP 0 0 0 ****EXCEPTION STATS ASIC
INSTANCE 1 (asic/core 0/1)****
===== Asic/core |
NAME | prev | current | delta
===== 0 1
NO_EXCEPTION 13168 16679 3511 0 1 IPV4_CHECKSUM_ERROR 0 0 0 0 1 ROUTED_AND_IP_OPTIONS_EXCEPTION
81 103 22
--snip--
```



rxPauseFrames	0	txPauseFrames	0
rxCos0PauseFrames	0	txCos0PauseFrames	0
rxCos1PauseFrames	0	txCos1PauseFrames	0
rxCos2PauseFrames	0	txCos2PauseFrames	0
rxCos3PauseFrames	0	txCos3PauseFrames	0
rxCos4PauseFrames	0	txCos4PauseFrames	0
rxCos5PauseFrames	0	txCos5PauseFrames	0
rxCos6PauseFrames	0	txCos6PauseFrames	0
rxCos7PauseFrames	0	txCos7PauseFrames	0
rxOamProcessedFrames	0	txOamFrames	0
NifRxPortStatusGroupStats:		NifTxPortStatusGroupStats:	
rxCollisionFragments	0	txLateCollisionFrames	0
rxFcsErrorFrames	0	txsystemFcsErrorFrames	0
rxInvalidOversizeFrames	0	txOversizeFrames	0
rxMacOverrunFrames	0	txMacUnderrunFrames	0
rxIpgViolationFrames	0	txDeferredFrames	0
rxOamDroppedFrames	0	txExcessiveDeferralFrames	0
rxSymbolErrorFrames	0	txOkMultipleCollisionFrames	0
rxValidOversizeFrames	0	txOkSingleCollisionFrames	0
rxValidUndersizeFrames	0	goldFramesTruncated	0
NifRxSizeGroupStats:		NifTxSizeGroupStats:	
rx32768toMtuFrames	0	tx32768toMtuFrames	0
rx16384to32767ByteFrames	0	tx16384to32767ByteFrames	0
rx8192to16383ByteFrames	0	tx8192to16383ByteFrames	0
rx4096to8191ByteFrames	0	tx4096to8191ByteFrames	0
rx2048to4095ByteFrames	0	tx2048to4095ByteFrames	0
rx1519to2047ByteFrames	51	tx1519to2047ByteFrames	0
rx1024to1518ByteFrames	15	tx1024to1518ByteFrames	0
rx512to1023ByteFrames	17	tx512to1023ByteFrames	187
rx256to511ByteFrames	3406	tx256to511ByteFrames	9407
rx128to255ByteFrames	6567	tx128to255ByteFrames	6580
rx65to127ByteFrames	11295	tx65to127ByteFrames	8583
rx64ByteFrames	18362	tx64ByteFrames	18458

-----  
**---> Input queue (Igr = Ingress)**

IgrPacketCounters:		EgrPacketCounters:	
packetsIn	97777	packetsIn	580324
packetsOut	97777	packetsEnqueueFcd_val	0
packetsDropped	3383	packetsMarkedForDrop	278
fpsSourcedPadErrorCount	0	padErrorPacketsIn	0
igrSourcedPadErrorCount	0	padErrorPacketsOut	0

=====  
For RWE for core 0:

RweTotalEnqStats:	
packetCount	580324
RweTotalDeqStats:	
packetCount	580046
FragmentCount	580046

=====  
For EQC for core 0:

EqcTotalEnqStats:	
Count	580704
EqcTotalDeqStats:	
Count	580324

=====  
For aqmRedQueueStats for asic port 12:

**AqmRedQueueStats: (sum of all queues)**

**---> Output queue (Aqm = Active queue management)**

acceptByteCnt0	0
acceptFrameCnt0	0
acceptByteCnt1	6407742
acceptFrameCnt1	43070
acceptByteCnt2	39609
acceptFrameCnt2	395

```

dropByteCnt0          0
dropFrameCnt0         0
dropByteCnt1          0
dropFrameCnt1         0
dropByteCnt2          0
dropFrameCnt2         0
outOfSoftBufDropByteCnt 0
outOfSoftBufDropFrameCnt 0
maxQebDropByteCnt    0
maxQebDropFrameCnt   0

```

=====

For PBC for core 0:

PbcIngressErrorDropCount:

```

iCount      0
iCount      0

```

PbcCreditCount:

```

creditCount      64
rwePbcStall      0

```

PbcEgressErrorDropCount:

```

eS0Count        0
eS1Count        0

```

PbcEnqFcErrorDropCount:

```

fCount          0

```

=====

For local/core 0 Switching:

SqsCumulativeStatistics

```

totalEnqStat      1368200
totalDeqStat      1368200
totalDropStat     0

```

SqsCumulativeStatisticsB

```

totalEnqStat      173449513
totalDeqStat      173449513
totalDropStat     0

```

=====

For local/core 1 Switching:

SqsCumulativeStatistics

```

totalEnqStat      890114
totalDeqStat      890114
totalDropStat     0

```

SqsCumulativeStatisticsB

```

totalEnqStat      105061923
totalDeqStat      105061923
totalDropStat     0

```

=====

For Sif 0 Switching:

SifSifPbcCnt0:

```

Count            81302675

```

SifSifPbcCnt1:

```

Count            58187651

```

SifRacInsertedCnt:

```

SifRacInsertedCnt[0]  2295051
SifRacInsertedCnt[1]  1738892
SifRacInsertedCnt[2]  1666479
SifRacInsertedCnt[3]  2773364
SifRacInsertedCnt[4]  3126116
SifRacInsertedCnt[5]  2066567

```

SifRacCopiedCnt:

```

SifRacCopiedCnt[0]   35850468
SifRacCopiedCnt[1]   19265491
SifRacCopiedCnt[2]   23814855
SifRacCopiedCnt[3]   32727259
SifRacCopiedCnt[4]   38376676
SifRacCopiedCnt[5]   22176467

```

=====

For Sif 1 Switching:

SifSifPbcCnt0:

```

Count            40956521

```

SifSifPbcCnt1:

```

Count            40956521

```

SifRacInsertedCnt:

```

SifRacInsertedCnt[0]  11713808
SifRacInsertedCnt[1]  8319576
SifRacInsertedCnt[2]  8816344
SifRacInsertedCnt[3]  15404080
SifRacInsertedCnt[4]  16161715
SifRacInsertedCnt[5]  9745420

```

SifRacCopiedCnt:

```

SifRacCopiedCnt[0]   8615615
SifRacCopiedCnt[1]   7489596
SifRacCopiedCnt[2]   7608895
SifRacCopiedCnt[3]   8717898
SifRacCopiedCnt[4]   9685735
SifRacCopiedCnt[5]   7866174

```

Verifique o status do controle de fluxo da perspectiva do Supervisor para a interface do painel frontal. Isso ajuda a identificar se há algum congestionamento na interface.

```
C9400#show platform hardware cman fp active flowcontrol status
slot 1:Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 EsmF - - - -
- - - - - IqsC - - - - -
Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 EsmF - - - - -
- - - - - IqsC - - - - - slot 2:
Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 EsmF - - - - -
- - - - - IqsC - - - - - Port 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 EsmF - - - - -
- - - - - IqsC - - - - - slot 3: Port 01
02 03 04 05 06 07 08 09 10 EsmF - - - - - IqsC 01 - - - - - slot 4: Port 01 02
03 04 05 06 07 08 09 10 EsmF - - - - - IqsC - - - - - slot 5: Port 01 02 03
04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 EsmF - - - - -
- - - - - IqsC - - - - - 01 - - - - - Port 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 EsmF - - - - -
- - - - - IqsC - - - - - slot 6: Possibly linecard is not
inserted slot 7: Possibly linecard is not inserted
```

Verifique se o tráfego de controle está fluindo de uma perspectiva de ASIC de encaminhamento do supervisor entre o ASIC de encaminhamento do supervisor no supervisor ativo e o ASIC de stub de placa de linha na placa de linha através das interfaces de OCI.

```
C9400#show platform hardware cman fp active oci status
processing oci information:
  chassis_type:      1
  sup slot:          4
  sup num oci ports: 8

slot_id 1 : oci_enable Enabled    Link Status 0 (UP)
             asic_id 1 core_id 0 oci_port 3 mac_id 0
             NruRxByteGroupStats: rxBytes 417829462717812          NruTxByteGroupStats: txBytes
588911286106332

slot_id 2 : oci_enable Enabled    Link Status 0 (UP)
             asic_id 0 core_id 0 oci_port 1 mac_id 1
             NruRxByteGroupStats: rxBytes 417938235716344          NruTxByteGroupStats: txBytes
588917607864892

slot_id 5 : oci_enable Enabled    Link Status 0 (UP)
             asic_id 1 core_id 0 oci_port 4 mac_id 1
             NruRxByteGroupStats: rxBytes 53195855717244          NruTxByteGroupStats: txBytes
588915422236932

slot_id 6 : oci_enable Enabled    Link Status 1 (DOWN)
             asic_id 2 core_id 0 oci_port 6 mac_id 0
             NruRxByteGroupStats: rxBytes 0                        NruTxByteGroupStats: txBytes 0

slot_id 7 : oci_enable Enabled    Link Status 1 (DOWN)
             asic_id 0 core_id 0 oci_port 2 mac_id 2
             NruRxByteGroupStats: rxBytes 0                        NruTxByteGroupStats: txBytes 0
```

## Estatísticas da placa de linha - Caminho de dados do supervisor para placa de linha

Verifique as estatísticas ASIC de stub da placa de linha associadas a uma interface específica do

painel frontal. Neste exemplo, a interface Gig1/0/13 é o foco.

### Exemplo de saída:

- Pacotes recebidos do Gig 1/0/13, insira a porta de recebimento da Interface de Rede e faça o progresso através do IQS até a interface da pilha.
- A partir daí, um pacote sai da interface da pilha para outro Supervisor ASIC , ou volta através do SQS, AQM, EQC, ESM, RWE e, em seguida, sai da interface de rede para transmissão do Gig 1/0/13.
- Os pacotes enviados de outras interfaces ASICs do supervisor que saem do Gig 1/0/13 entram em Sif e depois passam por SQS, AQM, EQC, ESM, RWE e depois saem do NifTx do Gig 1/0/13.
- Para o AQM, há 8 filas Tx. Se você vir descartes dessas filas, poderá usar este comando para determinar qual das filas está passando por quedas: show platform hardware fed active vai na fila stats interface Gig 1/0/13

```
C9400#show platform hardware iomd 1/0 data-path 13 detail ----> slot 1, interface 13
```

```
lcportmap.xml: ---> Line Card (lc) ASIC instance 0 is associated with interface Gig1/0/13
id 13 asic 0 asicport 12 mac 23 contextid 12 intl_port_sup0 9 intl_port_sup1 1 maxspeed
DEV_PORT_SPEED_1G asic_subport 4
```

```
fp_portmap.xml: ---> Supervisor ASIC 1, core 0 is associated with front panel (fp) interface
Gig1/0/13
```

```
id 13 asic 1 core 0 port 12 mac 0 subport 4 contextid 0 maxspeed DEV_PORT_SPEED_1G gpn 113
active 1
```

data path:

```
slot 3 +---ACTIVE SUP---+ | | ----> Supervisor ASIC 1, core 0 on the slot 3 active Supervisor
associated with interface Gig1/0/13
```

```
| ASIC 1 |
| Core 0 |
| Asic Port 12 |
| (Mac 0) |
|Nif_Rx NifTx|
+-----+
```

```
SLI MAC 9
```

```
+-----+
```

```
| SLI_Tx SLI_Rx| ----> Line Card 1. The statistic output below is only for this Line
card ASIC
```

```
| ASIC 0 |
| Asic Port 12 |
| (Mac 23) |
| NIF_Rx NIF_Tx|
+-----+
```

**Front Port 1/0/13**

```
^
|
|
|
V
```

=====

Nif MAC 23 Inforation:

NifRxByteGroupStats:

NifTxByteGroupStats:

rxBytes	4457854	txBytes	6440428
NifRxByteDestinationGroupStats:		NifTxByteDestinationGroupStats:	
rxUnicastBytes	1163684	txUnicastBytes	1164528
rxMulticastBytes	3294170	txMulticastBytes	5250491
rxBroadcastBytes	0	txBroadcastBytes	25409
NifRxPortStatusGroupStats:		NifTxFrameDestinationGroupStats:	
rxUnicastFrames	18155	txUnicastFrames	18158
rxMulticastFrames	21235	txMulticastFrames	24625
rxBroadcastFrames	0	txBroadcastFrames	51
rxPauseFrames	0	txPauseFrames	0
rxCos0PauseFrames	0	txCos0PauseFrames	0
rxCos1PauseFrames	0	txCos1PauseFrames	0
rxCos2PauseFrames	0	txCos2PauseFrames	0
rxCos3PauseFrames	0	txCos3PauseFrames	0
rxCos4PauseFrames	0	txCos4PauseFrames	0
rxCos5PauseFrames	0	txCos5PauseFrames	0
rxCos6PauseFrames	0	txCos6PauseFrames	0
rxCos7PauseFrames	0	txCos7PauseFrames	0
rxOamProcessedFrames	0	txOamFrames	0
NifRxPortStatusGroupStats:		NifTxPortStatusGroupStats:	
rxCollisionFragments	0	txLateCollisionFrames	0
rxFcsErrorFrames	0	txsystemFcsErrorFrames	0
rxInvalidOversizeFrames	0	txOversizeFrames	0
rxMacOverrunFrames	0	txMacUnderrunFrames	0
rxIpgViolationFrames	0	txDeferredFrames	0
rxOamDroppedFrames	0	txExcessiveDeferralFrames	0
rxSymbolErrorFrames	0	txOkMultipleCollisionFrames	0
rxValidOversizeFrames	0	txOkSingleCollisionFrames	0
rxValidUndersizeFrames	0	goldFramesTruncated	0
NifRxSizeGroupStats:		NifTxSizeGroupStats:	
rx32768toMtuFrames	0	tx32768toMtuFrames	0
rx16384to32767ByteFrames	0	tx16384to32767ByteFrames	0
rx8192to16383ByteFrames	0	tx8192to16383ByteFrames	0
rx4096to8191ByteFrames	0	tx4096to8191ByteFrames	0
rx2048to4095ByteFrames	0	tx2048to4095ByteFrames	0
rx1519to2047ByteFrames	51	tx1519to2047ByteFrames	0
rx1024to1518ByteFrames	15	tx1024to1518ByteFrames	0
rx512to1023ByteFrames	17	tx512to1023ByteFrames	186
rx256to511ByteFrames	3374	tx256to511ByteFrames	9318
rx128to255ByteFrames	6505	tx128to255ByteFrames	6518
rx65to127ByteFrames	11237	tx65to127ByteFrames	8526
rx64ByteFrames	18191	tx64ByteFrames	18286

-----  
**---> Input queue (Igr = Ingress)**

IgrPacketCounters:		EgrPacketCounters:	
packetsIn	97078	packetsIn	576307
packetsOut	97078	packetsEnqueueFcd_val	0
packetsDropped	0	packetsMarkedForDrop	0
fpsSourcedPadErrorCount	0	padErrorPacketsIn	0
igrSourcedPadErrorCount	0	padErrorPacketsOut	0

=====  
For aqmRedQueueStats for asic port 12:

**---> Output queue (Agm = Active queue management)**

<b>AqmRedQueueStats:</b>	<b>(sum of all queues)</b>
acceptByteCnt0	0
acceptFrameCnt0	0
acceptByteCnt1	0
acceptFrameCnt1	0
acceptByteCnt2	6440428
acceptFrameCnt2	42834
dropByteCnt0	0
dropFrameCnt0	0
dropByteCnt1	0
dropFrameCnt1	0

```

dropByteCnt2          0
dropFrameCnt2        0
outOfSoftBufDropByteCnt  0
outOfSoftBufDropFrameCnt 0
maxQebDropByteCnt    0
maxQebDropFrameCnt    0

```

=====

SLI MAC 9 - SUP 0: ( an ACTIVE sup in slot 3 )

```

SliTxByteGroupStats:          SliRxByteGroupStats:
txBytes          4457854      rxBytes          6440428

```

SLI MAC 1 - SUP 1:

```

SliTxByteGroupStats:          SliRxByteGroupStats:
txBytes          0            rxBytes          0

```

Verifique o status do controle de fluxo da perspectiva da placa de linha para a interface do painel frontal. Isso ajuda a identificar qualquer congestionamento na interface.

- Os valores são "-" quando não há controle de fluxo, caso contrário, o número da fila que está passando por controle de fluxo (congestionamento) é indicado.
- O controle de fluxo recebido pela interface é passado do ASIC da placa de linha na placa de linha para o ASIC do supervisor no supervisor onde o AQM cai normalmente é visto no ASIC do supervisor. O OCI (Out-of-band Control Interface) é o canal de comunicação interna entre a placa de linha e o supervisor ativo usado para sinalizar o controle de fluxo da placa de linha para o supervisor.

C9400#show platform hardware iomd 1/0 flowcontrol status ---> slot 1

Slot 1 - number of ports 48

```

slot 1:  Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
         IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
         IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
         IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

```

Verifique se o tráfego de controle está fluindo de uma perspectiva ASIC de stub de placa de linha entre o ASIC de stub de placa de linha na placa de linha e o ASIC de encaminhamento do supervisor nos supervisores ativos e em standby através das interfaces OCI.

- OCI = Out-of-band Control Interface = canais de comunicação internos entre a placa de linha e os supervisores ativos e em standby

C9400#show platform hardware iomd 1/0 oci status ---> slot 1

```

Asic 0, Mac 10, Tx OCI Config 0, OCI Merge FALSE, OCI Enabled, Link Status 0 (UP)
Network Port Range 0---47, Local Port Range 0---47
NifRxByteGroupStats:  rxBytes 177402572782108      NifTxByteGroupStats:  txBytes
141925777717156

```

```

Asic 0, Mac 11, Tx OCI Config 0, OCI Merge FALSE, OCI Enabled, Link Status 0 (UP)
Network Port Range 0---47, Local Port Range 0---47

```



Verifique quais interfaces na placa de linha fazem parte do mesmo grupo de portas que compartilha 8 Gbps de largura de banda do ASIC de stub de placa de linha na placa de linha em direção ao ASIC de encaminhamento do supervisor no Supervisor ativo. Cada grupo de portas está associado a um SLI (System Link Interface, Interface de enlace do sistema) no ASIC de stub de placa de linha para o Supervisor.

C9400#show platform hardware iomd 1/0 portgroups ---> slot 1

Port Interface Status Interface Group Max <-- aggregate bandwidth for 8 ports  
Group Bandwith Bandwidth

Port	Interface	Status	Interface	Group	Max	<-- aggregate bandwidth for 8 ports
Group	Bandwith	Bandwidth				
1	TenGigabitEthernet1/0/1	up			1G	
1	TenGigabitEthernet1/0/2	down			1G	
1	TenGigabitEthernet1/0/3	admindown			1G	
1	TenGigabitEthernet1/0/4	down			1G	
1	TenGigabitEthernet1/0/5	down			1G	8G
1	TenGigabitEthernet1/0/6	down			1G	
1	TenGigabitEthernet1/0/7	down			1G	
1	TenGigabitEthernet1/0/8	down			1G	
2	TenGigabitEthernet1/0/9	down			1G	
2	TenGigabitEthernet1/0/10	down			1G	
2	TenGigabitEthernet1/0/11	down			1G	
2	TenGigabitEthernet1/0/12	down			1G	
2	TenGigabitEthernet1/0/13	up			1G	8G
2	TenGigabitEthernet1/0/14	down			1G	
2	TenGigabitEthernet1/0/15	down			1G	
2	TenGigabitEthernet1/0/16	down			1G	
3	TenGigabitEthernet1/0/17	down			1G	
3	TenGigabitEthernet1/0/18	down			1G	
3	TenGigabitEthernet1/0/19	down			1G	
3	TenGigabitEthernet1/0/20	down			1G	
3	TenGigabitEthernet1/0/21	down			1G	8G
3	TenGigabitEthernet1/0/22	down			1G	
3	TenGigabitEthernet1/0/23	down			1G	
3	TenGigabitEthernet1/0/24	down			1G	
4	TenGigabitEthernet1/0/25	down			1G	
4	TenGigabitEthernet1/0/26	down			1G	
4	TenGigabitEthernet1/0/27	down			1G	
4	TenGigabitEthernet1/0/28	down			1G	
4	TenGigabitEthernet1/0/29	down			1G	8G
4	TenGigabitEthernet1/0/30	down			1G	
4	TenGigabitEthernet1/0/31	down			1G	
4	TenGigabitEthernet1/0/32	down			1G	
5	TenGigabitEthernet1/0/33	down			1G	
5	TenGigabitEthernet1/0/34	down			1G	
5	TenGigabitEthernet1/0/35	down			1G	
5	TenGigabitEthernet1/0/36	down			1G	
5	TenGigabitEthernet1/0/37	down			1G	8G
5	TenGigabitEthernet1/0/38	down			1G	
5	TenGigabitEthernet1/0/39	down			1G	
5	TenGigabitEthernet1/0/40	down			1G	
6	TenGigabitEthernet1/0/41	down			1G	
6	TenGigabitEthernet1/0/42	down			1G	

6	TenGigabitEthernet1/0/43	down	1G	
6	TenGigabitEthernet1/0/44	down	1G	
6	TenGigabitEthernet1/0/45	down	1G	8G
6	TenGigabitEthernet1/0/46	down	1G	
6	TenGigabitEthernet1/0/47	down	1G	
6	TenGigabitEthernet1/0/48	up	1G	